EERC Technology… Putting Research into Practice

The Plains CO_2 Reduction (PCOR) Partnership

Lignite Field Validation Test Overview

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Pittsburgh, PA

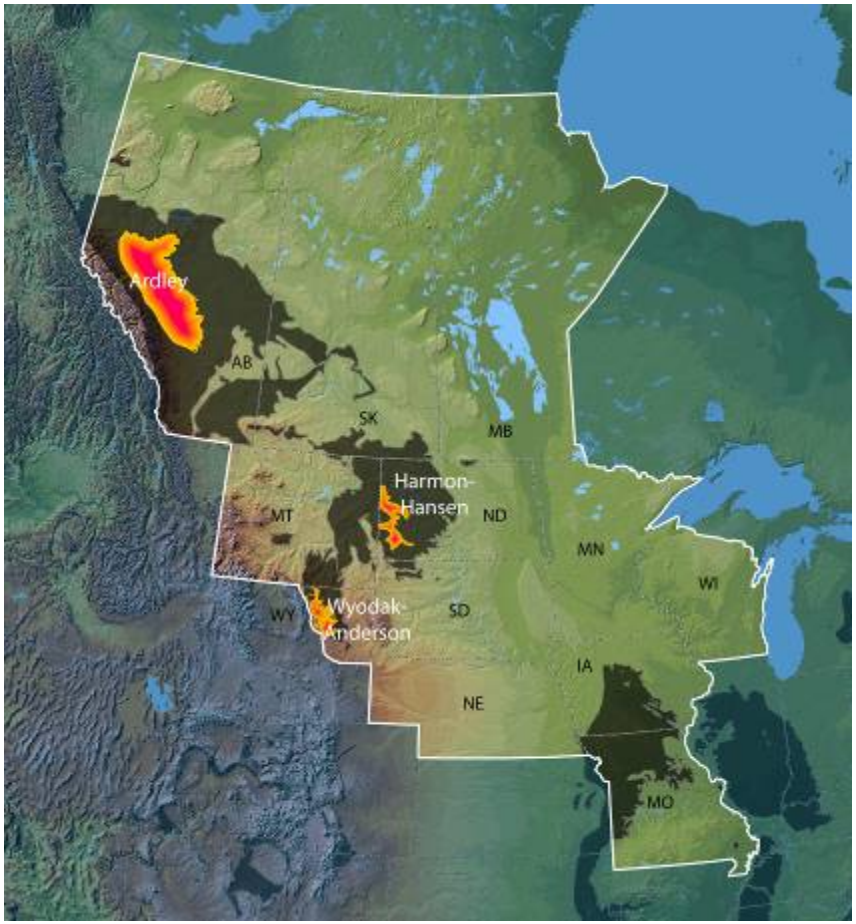
October 3–4, 2006

Lignite Field Validation Test

•Provide field validation testing of sequestration technologies and infrastructure approaches that can lead to wide-scale deployment in coal fields throughout the PCOR Region.

Lignite Field Validation Test Objectives

- Test the ability of lignite coals to produce methane gas.
- Determine the effect of CO_2 on lignite gas productivity.
- Determine the potential for lignites to permanently sequester CO_2.



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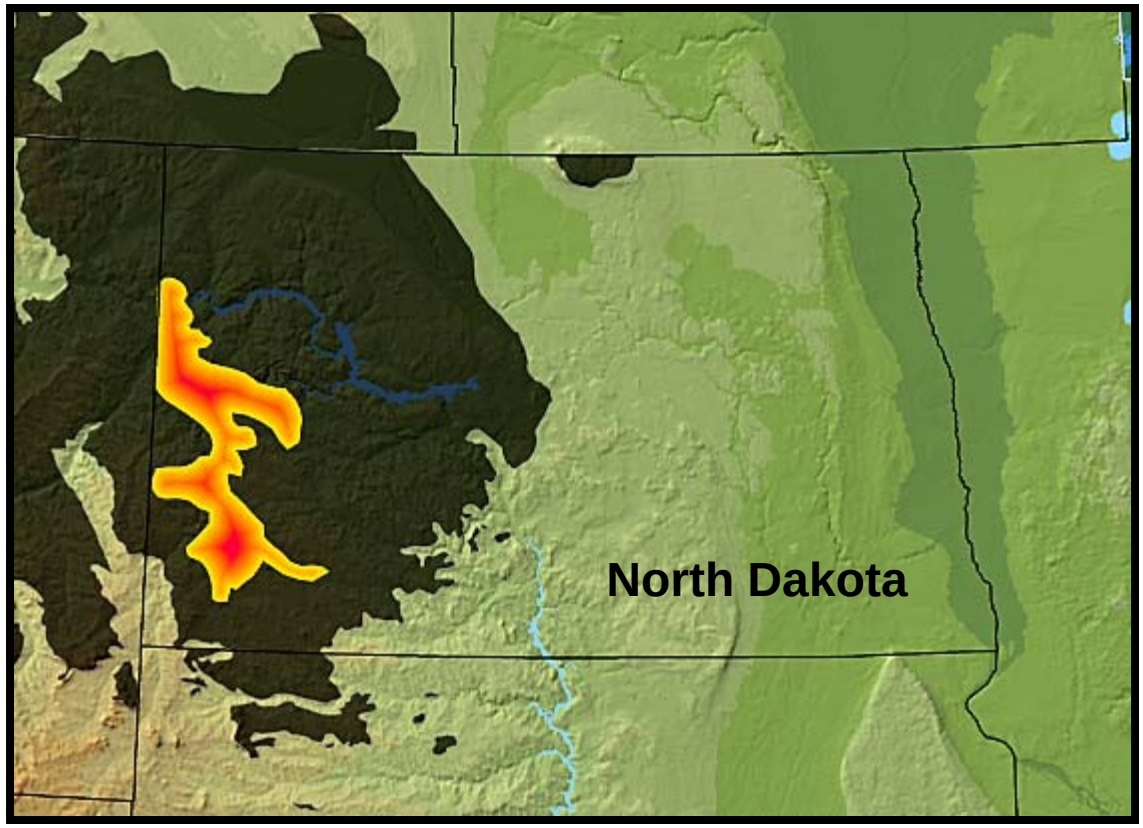
Lignite Field Validation Test



Injection of CO_2 from commercial facility

>95% CO_2

Minimum of 1000 tonnes of CO_2 will be injected during demo period.

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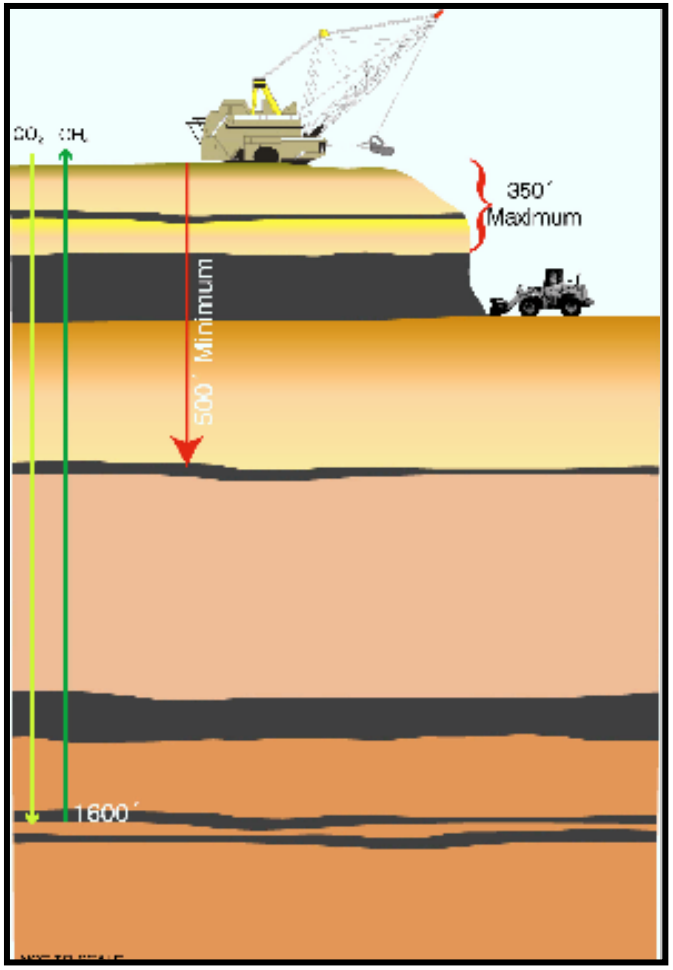

Injection Zone Characteristics

- Low-rank coal
- Injection depth ~ 490m (1600ft)
- Reservoir depth and temperature are low enough that CO_2 will be in gas phase

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Lignite Coal Seam, continued

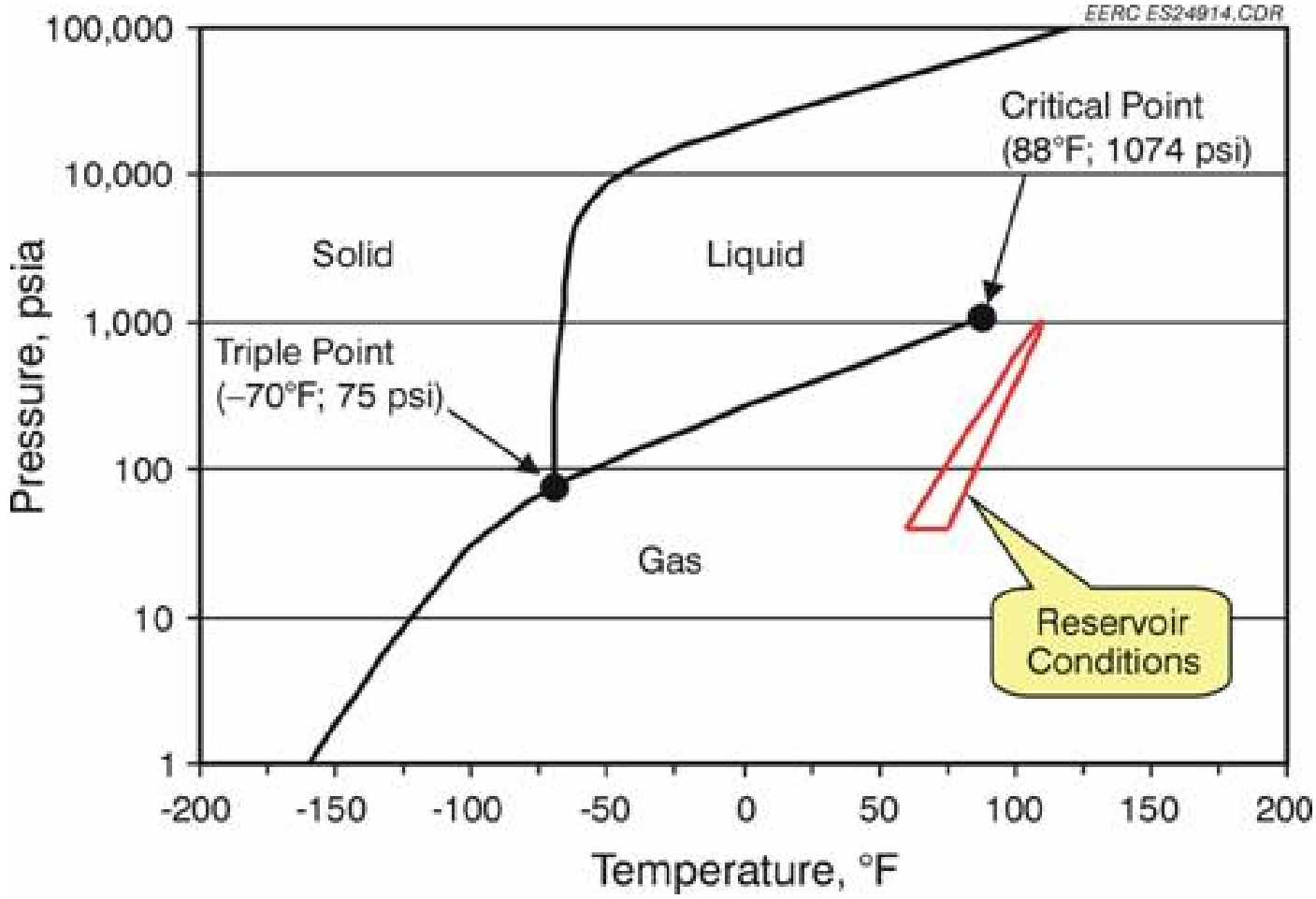

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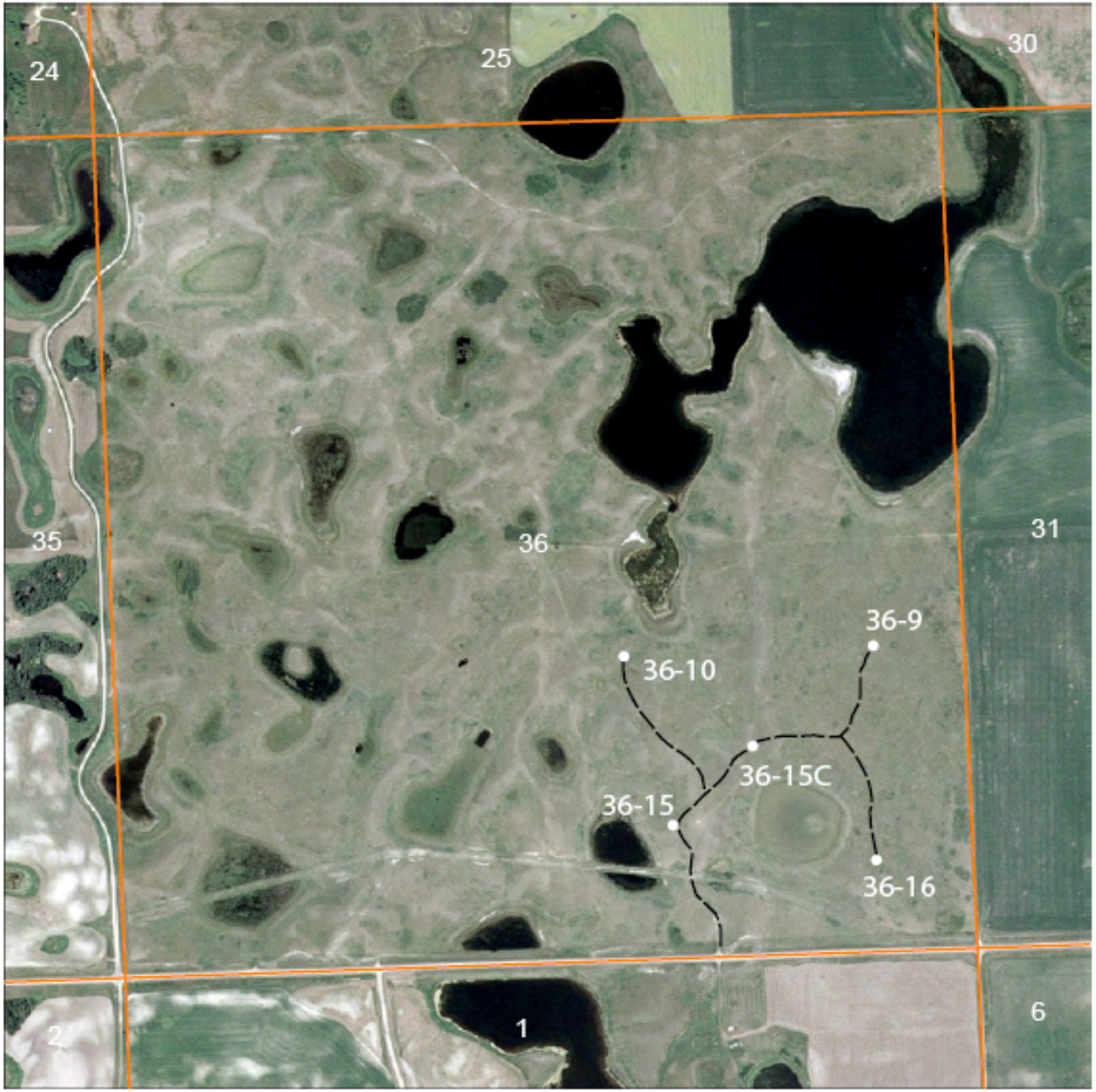
Exhibit 1

Lignite CBM Research Project
Burke County, ND

Section 36, T. 159 N., R. 90 W.

Proposed access route



- Drill and complete 4 monitoring wells.
- Complete an existing well for CO_2 injection.

Location Map

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Lignite Field Validation Test

- State of North Dakota is providing surface and mineral rights access.
- PCOR Partner Eagle Operating is assisting with drilling and well operations.
- Flatland Exploration Company is providing technical and operational support with respect to well drilling and sampling.

MMV Efforts

- Monitoring wells will be installed into the coal seam injection zone and shallow aquifer.
  - Coal seam formation and aquifer are separated by a clay-rich glacial till.
    - Low porosity
    - Low permeability
  - Monitor pressure, temperature, pH, and resistivity in coal seam injection zone and shallow aquifer (approximately 1300 feet above highest target coal seam).

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Lignite Field Validation Test Accomplishments to Date

- Baseline geologic and hydrogeologic date have been gathered and evaluated.
  - Numerous coal seams ranging from 1600 to 1800 feet below ground surface have been identified.
  - Coal seam thicknesses ranged from 2 to 10 feet.

Lignite Field Validation Test Accomplishments to Date

- Drilling locations have been identified.
- Drilling procedures for the test holes are under development.
- Draft NEPA questionnaire has been submitted.

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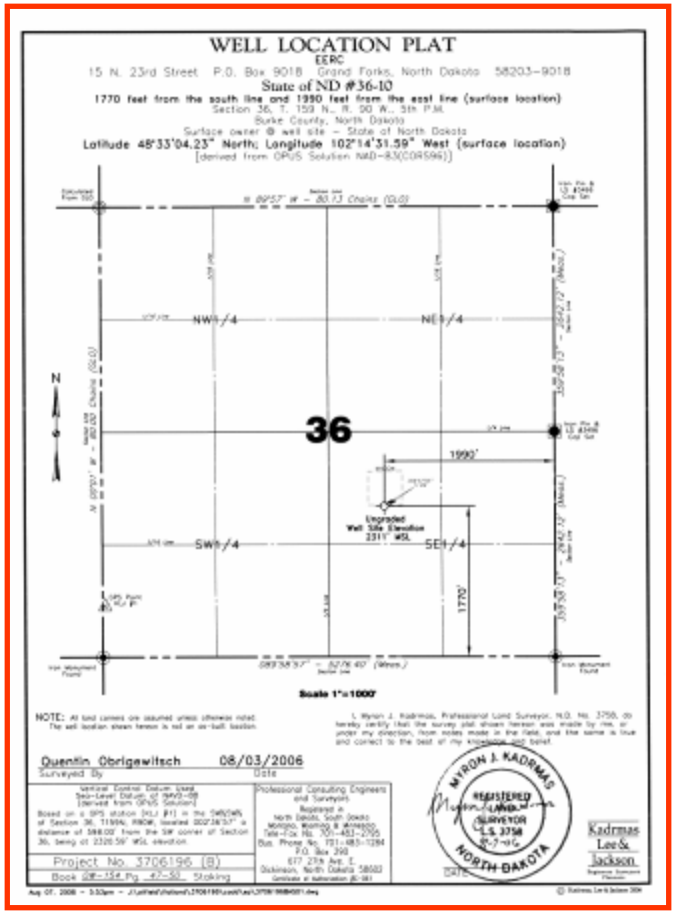
Lignite Field Validation Test Accomplishments to Date

- A public hearing to discuss well spacing was held on September 27, 2006.
  - Hearing necessitated by the variance in well spacing.
    - North Dakota Industrial Commission (NDIC) rules indicate one well per 160 acres, this field validation test has 5 wells.
    - Provided testimony and exhibits as to the need of the research well configuration.

Lignite Field Validation Test
Next Steps

- Drilling Permits
  - Will be filed in early October.
  - Need to include an accurate, certified plat showing the location of the proposed well.
  - Need to include a drilling prognosis.



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Lignite Field Validation Test
Next Steps

- Drilling Prognosis
  - Proposed total depth (including measured depth if appropriate) to which the well will be drilled
  - Estimated depth to the top of important geological markers
  - Estimated depth to the top of objective horizons
  - Proposed mud program

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Next Steps

- Drilling Prognosis (cont.)
  - Proposed casing program
    - Size and weight
    - Proposed depth at which each casing string is to be set
    - Proposed amount of cement to be used
    - Estimated top of cement

Lignite Field Validation Test Summary

- Task is 6 months ahead of schedule.
- Hope to begin drilling this fall.
- Numerous partners are key to successful project.
- Stay tuned.

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Thank You!

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